

RIVER STAGES AND FLOODS

By C. R. JORDAN

Precipitation during March averaged well above normal over most of the United States, being especially heavy over the Mississippi and Ohio River Valleys. Unusually dry weather prevailed in the Eastern and Southeastern States and in the western Great Plains.

The most noteworthy hydrologic feature of the month was the Ohio River flood which, while not record-breaking, was generally second in magnitude (except for an earlier flood in 1884) to the flood of January 1937, the greatest flood of record in a large reach of the river. An early thaw and break-up in the upper Mississippi and Missouri Basins raised the Mississippi River and numerous tributaries to flood stages. These floods were combined at Cairo, Ill., and were joined later in the month by floods from excessive rainfalls over the Arkansas and Red River Basins to produce floods in the lower Mississippi River, the stages in Louisiana exceeding by mid-April those reached in the flood of 1937. There was some overflow at scattered points throughout Pennsylvania, New York, and New England; and rather extensive flooding in the west South-central States.

Hudson Bay Drainage.—A flood of limited extent, due almost entirely to snow-melt, occurred in the Red River of the North during the latter part of March and early April. The river reached a crest of 26.6 feet, 9.6 feet above flood stage, at Fargo, N. Dak., on the 18th. Damage caused by the flood was reported as \$18,827.

Lake Erie Drainage.—The St. Marys River at Decatur, Ind., and the Maumee River at Fort Wayne, Ind., rose rapidly on March 31, and passed flood stage on March 31 and April 1, respectively. The floods continued into April.

March 1945, was the wettest month of record in Ohio. At Columbus it was the wettest March since 1913 and the wettest of all months in the last 32 years, with the single exception of January 1937. Heaviest rains fell on the 2d, 6th, and from the 19th to 21st. Flood stage was exceeded slightly at Upper Sandusky, Ohio, on the 7th and from the 20th to 21st, but no important damage was reported.

Atlantic Slope Drainage.—The unusually heavy snow cover that accumulated in Pennsylvania, New York, and New England during the winter of 1944-45, featured in earlier issues of the REVIEW, and the usually troublesome ice in the rivers was melted away in progressive stages during the 5-week period beginning about February 21 and discharged to the sea without serious overflow. It must be conceded that "Mother Nature" behaved exceedingly well this season. Less than normal and well distributed precipitation during the month with occasional cold weather that slowed down the rate of run-off from snow-melt were important factors in preventing serious overflow.

Only minor flooding of lowlands along the rivers occurred at scattered points throughout New England, New York, and Pennsylvania, and little or no damage resulted. The following summary of the melting of snow and ice and resulting overflow in the Connecticut River Basin was received from the Official in Charge, Weather Bureau Office, Hartford, Conn.:

In general, only minor flooding developed in lowland areas, where the main river exceeded bankful stages several times during the last half of the month. Flood conditions were due almost entirely to run-off from the heavy snow cover which had accumulated during the winter. Above normal temperatures began late in February and continued throughout the first half of March to produce a steadily increasing flow in tributaries and the main river.

Flood stages did not develop, however, until an extremely warm trend began on March 15 which was not checked until March 22. During these 7 days the temperature averaged 17.4 degrees above normal at Hartford, with an extreme temperature of 81° occurring on March 20. Fortunately, a cold air mass enveloped the northern half of Vermont and New Hampshire during this period and prevented rapid run-off from this area still covered by heavy snow. The first freshet produced during this period of high temperatures exceeded flood stage only slightly, 0.2 foot, at South Newbury, Vt., on March 20-21 and 2.3 feet at Hartford, Conn., on March 21. Another flood wave developed a few days later in connection with about an inch of rain which fell March 21-22 to augment the rapid snow-melt of the 20th. This second rise came before the first could subside, and flood stage was just equalled at White River Junction, Vt., on March 22 and was exceeded by 1.6 feet at Montague City, Mass. on March 22 and by 4.9 feet at Hartford on March 23. The third wave during the month occurred when record-breaking March temperatures developed on March 28-30 reaching this time into the extreme northern portion of the basin. This third wave of high water exceeded flood stage 3.5 feet at South Newbury on March 31 and caused a rise of about 5 feet at White River Junction to 0.1 foot above flood stage on April 1 and a rise at Hartford of about 3 feet to 1.5 feet above flood stage on March 31.

River ice melted away or broke up early with moderate rises of the tributaries and main river in such manner as to prevent serious ice jams when the higher freshets occurred later in the month. Ice was out of the river below Montague City on March 15, and it had broken away at Walpole, N. H., on March 13, and at South Newbury on March 31 and at North Stratford, N. H., on March 15.

Considering the critical flood potentialities in the heavy snow cover which blanketed the entire basin on March 1 and the subsequent record-breaking warm weather, it is remarkable that so much water could be released in 1 month without causing damaging floods. Less than normal precipitation well distributed during the month, together with occasional cool weather which slowed down the rate of snow-melt at times, were factors which aided materially in preventing higher river stages.

There were four rises in the Susquehanna River during March that approached or exceeded flood stage in the upper basin, but at and below Towanda, Pa., flood stage was exceeded only at Towanda where the stage reached 0.2 foot above bankful on March 4.

The month was unusually dry in the Southeastern States and the only overflow reported was at a few points in Virginia and South Carolina during the early part of the month and were, for the most part, run-off from rainfall during the closing days of February.

East Gulf of Mexico Drainage.—The Tombigbee River from Gainesville southward remained above flood stage on March 1 from the February rains, and additional rain during March resulted in above flood stages on the Black Warrior and upper Tombigbee Rivers during the first week of March and maintained above bankful stages below Demopolis, Ala., on the Tombigbee River through the end of March. No damage was reported from any of the rises during March, but the continued overflow of the lower river will delay planting and prevent lumbering operations.

Pearl River was considerably above flood stage at most stations at the beginning of the month. Several moderate to heavy rains during the month caused only slight rises in most instances since the rivers were already high, but the rains were frequent and heavy enough to keep the stages well above flood stage the entire month. Damage was reported along the entire length of the Pearl River System with the most severe damage occurring in the Jackson, Miss., area. Several sections of Jackson were flooded, causing some industries to suspend work for several days. Many bridges were destroyed or badly damaged. Loss during the flood of the last half of February and March 1945, including the suspension of business, amounted to about \$190,000.